AMENDMENTS TO THE CLAIMS

Please amend the claims according to the following claim listing.

1. (Currently Amended) A device for sensing a target analyte in a sample comprising: an optical conduit having a proximal end and a distal end; an optical system at the proximal end of the optical conduit comprising at least one electromagnetic energy emitter and at least one electromagnetic energy detector; and a sensing element in optical proximity to the distal end of the optical conduit comprising at least one periplasmic binding protein ~~adapted to bind~~ capable of specifically binding with at least one target analyte and at least one reporter group associated with the periplasmic binding protein, wherein the peripasmic binding protein and reporter group are entrapped within or attached to a polymeric matrix, wherein said matrix permits said periplasmic binding protein to retain conformational mobility, wherein the reporter group is adapted to undergo a luminescence change upon specific binding of the periplasmic binding protein to the target analyte, ~~, and optionally, at least one reference group.~~

2. (Original) The device of claim 1, further comprising a tip.

3. (Original) The device of claim 2, wherein the sensing element is contained within the tip.

4. (Previously Presented) The device of claim 3, wherein the sensing element is attached to an inner surface of the tip and the tip is directly attached to the distal end of the optical conduit.

5. (Original) The device of claim 1, wherein the sensing element is directly attached to the distal end of the optical conduit.

6. (Original) The device of claim 1, further comprising one or more connectors.

7. (Original) The device of claim 6, wherein the sensing element is attached to the distal end of the optical conduit through a connector.

8. (Canceled)

9. (Currently Amended) The device of claim [[8]] 7, wherein the polymer matrix is directly attached to the distal end of the optical conduit.

10. (Currently Amended) The device of claim [[8]] 7, wherein the polymer matrix is attached to an inner surface of a tip wherein the tip is directly attached to the distal end of the optical conduit.

11. (Currently Amended) The device of claim [[8]] 7, wherein the polymer matrix is attached to an inner surface of a tip wherein the tip is directly attached to a connector that is directly attached to the distal end of the optical conduit.

12. (Original) The device of claim 1, wherein the sensing element is attached to a polymer chain.

13. (Original) The device of claim 12, wherein said polymer chain is attached to the distal end of the optical conduit.

14. (Previously Presented) The device of claim 12, wherein the polymer chain is attached to an inner surface of a tip wherein the tip is directly attached to the distal end of the optical conduit.

15. (Previously Presented) The device of claim 12, wherein the polymer chain is attached to an inner surface of a tip wherein the tip is directly attached to a connector that is directly attached to the distal end of the optical conduit.

16. (Original) The device of claim 6, wherein the optical system is attached to the proximal end of the optical conduit through the connector.

17. (Original) The device of claim 6, wherein the sensing element is attached to the distal end of the optical conduit through a connector and the optical system is attached to the proximal end of the optical conduit through a connector.

18. (Previously Presented) The device of claims 16 or 17, further comprising a tip wherein the tip is attached to the distal end of the optical conduit through a connector.

19. (Original) The device of claim 1, wherein the optical conduit comprises at least one optical fiber.

20. (Original) The device of claim 1, wherein the electromagnetic energy emitter is selected from the group consisting of an arc lamp, light emitting diode, and laser diode.

21. (Original) The device of claim 1, wherein the electromagnetic energy detector is a photodiode, photomultiplier tube, or charge coupled device.

22. (Original) The device of claim 1, wherein said optical system further comprises optical elements adapted to distinguish multiple wavelengths.

23. (Original) The device of claim 22, wherein said optical elements further comprise optical filters, dichroic components, holographic components, or combinations thereof.

24. (Original) The device of claim 21, wherein said electromagnetic energy detector is adapted to detect energy emitted by said reporter group substantially continuously.

25. (Original) The device of claim 21 wherein said electromagnetic energy detector is adapted to detect energy emitted by said reporter group periodically.

26. (Original) The device of claim 1, wherein said optical system further comprises electrical or optoelectronic elements for modulation of the signal from the electromagnetic energy emitter.

27. (Original) The device of claim 1, wherein said optical system further comprises electrical or optoelectronic elements for modulation of the luminescence signal received by the electromagnetic energy detector.

28. (Original) The device of claim 1, wherein the optical system is adapted to measure the intensity of the luminescence signal.

29. (Original) The device of claim 1, wherein the optical system is adapted to measure the wavelength of the luminescence signal.

30. (Original) The device of claim 1, wherein the optical system is adapted to measure the lifetime of the luminescence signal.

31. (Original) The device of claim 1, wherein the optical system is adapted to measure the polarization of the luminescence signal.

32. (Original) The device of claim 1, wherein the optical system is adapted to measure the energy transfer efficiency of the reporter group.

33. (Original) The device of claim 2, wherein said tip further comprises a metal frame.

34. (Previously Presented) The device of claim 1, wherein the device comprises at least one reference group, and wherein the at least one reference group is associated with a protein.

35. (Original) The device of claim 1, wherein said sensing element is further adapted to be inserted into or through the skin of a patient.

36. (Previously Presented) The device of claim 1, wherein the device comprises at least one reference group, and wherein the at least one reporter group and the at least one reference group are excited at the same wavelengths.

37. (Previously Presented) The device of claim 1, wherein the device comprises at least one reference group, and wherein the at least one reporter group and the at least one reference group are excited at different wavelengths.

38. (Previously Presented) The device of claim 1, wherein the device comprises at least one reference group, and wherein the luminescence of the at least one reporter group and the luminescence of the at least one reference group are detected at different wavelengths.

39. (Previously Presented) The device of claim 1, wherein the device comprises at least one reference group, and wherein the luminescence of the at least one reporter group and the luminescence of the at least one reference group are detected at the same wavelengths.

40. (Original) The device of claim 1, wherein the reporter group comprises a pair of organic dyes chosen so that the energy transfer efficiency between the pair changes upon analyte binding.

41. (Original) The device of claim 1, wherein the reporter group comprises a pair of fusion proteins chosen so that the energy transfer efficiency between the pair changes upon analyte binding.

42. (Original) The device of claim 1, wherein the reporter group comprises an organic dye and a fusion protein chosen so that the energy transfer efficiency between the organic dye and the fusion protein changes upon analyte binding.

43. (New) The device of claim 1, where said periplasmic binding protein is a glucose-galactose binding protein.

44. (New) The device of claim 1, wherein said target analyte is glucose.